XII · No. 6

NOVEMBER–DECEMBER, 1959

ANIMAL KINGDOM

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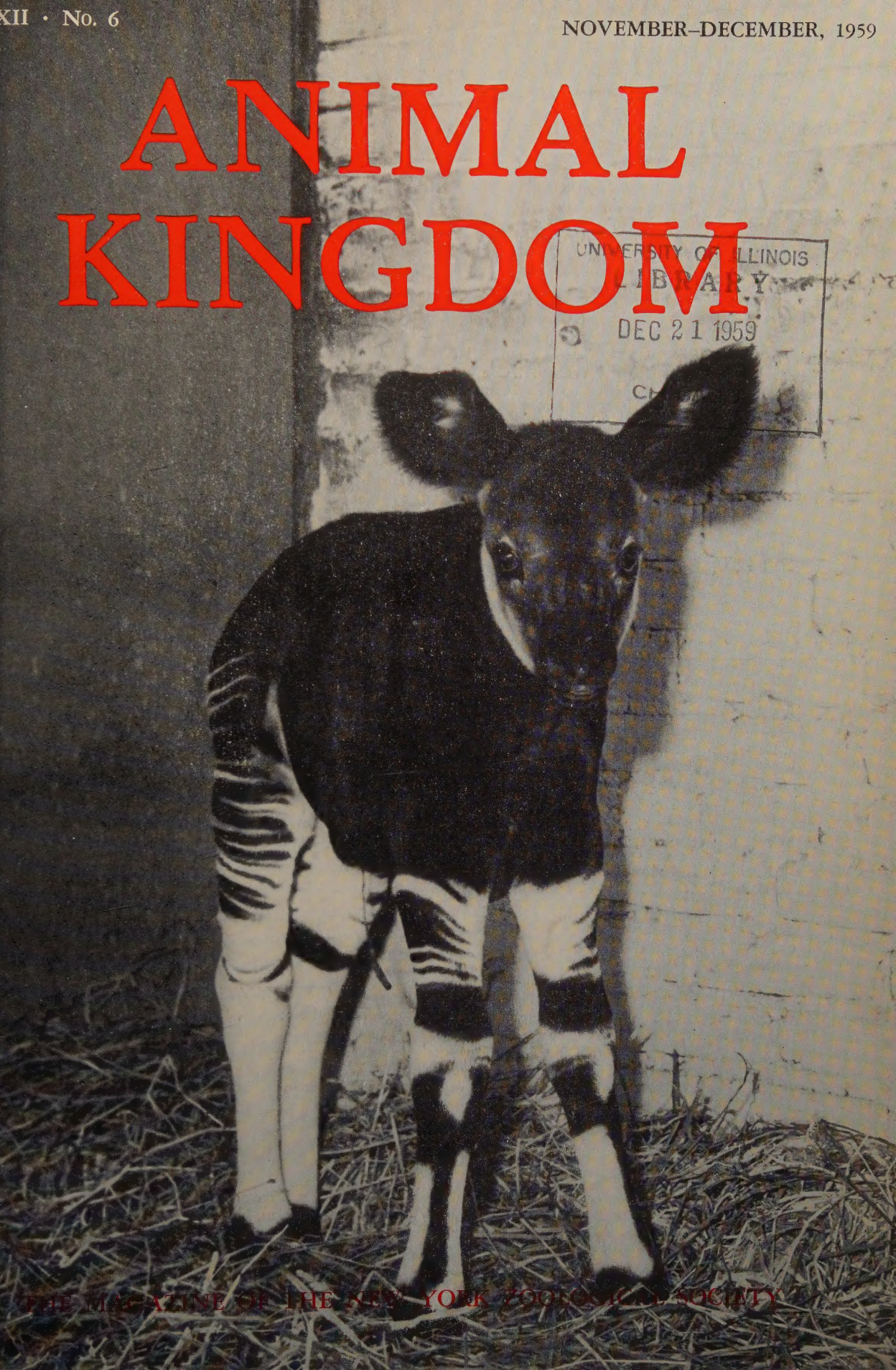

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ANIMAL KINGDOM

Bulletin of the New York Zoological Society

In This Issue

Baby Okapi—4 Days Old *Sam Dunton* Cover

An Okapi Is Born in the Zoo *Joseph A. Davis, Jr.* 162

The Matamata: Surely *All* Turtles Can Swim? *James A. Oliver* 167

Trumpeter Swans Return to the Zoo *William G. Conway* 171

The First Takin in America *Ann M. Milton* 173

The Great Tinamou of the Tropical Forest *Alexander F. Skutch* 179

New Shows Outdoors at the Aquarium *William Bridges* 184

Conservation Foundation 186

Behind the Scenes 187

Index to Volume XLII 190

Vol. LXII DECEMBER 1959 **No. 6**

Issued bi-monthly at the Offices of the New York Zoological Society, 30 East Fortieth Street, New York 16, N. Y. Editorial and Subscription Offices, Zoological Park, Bronx Park, New York 60, N. Y. Title registered with United States Patent Office • Subscription, $3.50 a year; single copy, 60 cents. Same rates for all foreign countries and Canada. All pictures not otherwise credited are from the photographic collection of the New York Zoological Society.

Reserve Stock

IN RECENT YEARS we have been attaching constantly greater importance to the breeding of wild animals in the Zoo. Success is meeting these efforts, as evidenced by the fact that during the last two years 46 species of mammals produced young. Birds, under our conditions, are more difficult, as they need seclusion and space, yet in this department we have been successful in rearing more than 30 species, including rarities such as the Bronze-tailed Peacock Pheasant from Sumatra. Not to be outdone, the Reptile Department has scored some triumphs of its own, among them the notable one of breeding the King Cobra for the first time in zoological history.

As a general rule animals will not breed in captivity unless they are in a condition of "welfare," mental as well as physical, and it is a reflection of the great improvement in the techniques of caring for animals in captivity that more and more success is being gained in breeding, not only in our zoo but in others here and abroad.

The desirability of encouraging the breeding of animals in the zoo is two-fold. First, baby animals have their own particular charms and certainly add immensely to the enjoyment of visitors. A second reason is that the existence of a number of species of animals in the wild state is today severely threatened. The primary goal is of course to preserve wild animals in their own natural habitat, but zoos can nevertheless do their part in helping to preserve rare forms whose situation is precarious. This is one of the reasons why we felt special joy in the recent birth of a young Okapi, one of the rarest animals on earth, that exists only in limited numbers in the tropical forests of Africa. A striking example of last-ditch preservation is that of the Père David Deer of Asia. Eighty years ago not a single example of this species remained alive in the wild. Its preservation was made possible only by the breeding herd maintained by the Duke of Bedford in England. In 1946 we acquired two pairs from his estate, the first to come to the United States. Since then eleven offspring have been reared. They are sturdy animals that ultimately might become reestablished in reserve areas.

All in all, this breeding of wild animals in the Zoo is an excellent idea. It adds greatly to the pleasure of visitors and it contributes in at least some small degree to the preservation of endangered species.

Fairfield Osborn

AN OKAPI IS BORN IN THE ZOO

By JOSEPH A. DAVIS, JR.
Assistant Curator of Mammals

IN MID-OCTOBER a male calf was born to Muyoni and Bilota, our Okapis. The birth and events of the days preceding and following it will be reported fully in *Zoologica* but that technical paper will of course omit what might be called "the human side" of the experience. Why, for example, a keeper working alone in the Antelope House must remember to hum to himself as he moves about, and how I had to learn to do the same to avoid startling an animal by appearing without warning in front of its stall. What follows here is a general account of a short period in the lives of Muyoni and her calf and the people whose whole interests centered around her at this important time.

It was late in the summer that Muyoni gave indications of pregnancy — a growing fullness of body and an almost imperceptible development of the udder. But the changes were so slight that we could only speculate about the date of birth, and all guesses set it too early. The knowledge that conception took place on August 2, 1958, was no help. There is a growing body of literature on the reproduction of the Okapi, but no agreement on the gestation period. Published estimates varied from 10 to 16 months, and neither extreme was convincing; by the time we were sure a calf was on the way, Muyoni had already passed the 10-month mark.

With the arrival of October we felt certain that the event was not more than a week away. All seemed quiet and normal enough, but apprehension grew as we read and reread the accounts of Okapi births in European zoological gardens. In Antwerp the first calf was aborted and the next two were killed by the mother. The fourth and fifth were removed from the mother's care immediately after birth but only one of them survived. Human intervention had been required during delivery of the first Okapi born in the Vincennes Zoo in Paris and just after the birth the mother turned on her keeper, nearly striking the baby with her hooves, and chased the man out of her stall. Her hostility did not dissipate for almost a month, although previously she had been as gentle as our Muyoni. These circumstances naturally gave us a great deal to think about.

Our only encouragement was the news that an Okapi had been born in the Brookfield Zoo in Chicago on September 17. Director Robert Bean

reported that it was uneventful – no problems at all. But Okapis obviously vary and we continued to fear and prepare for the worst.

Last-minute changes in an animal's environment may do more harm than good. For this reason we had begun in September to modify Muyoni's stall, so that she would have time to accustom herself to new conditions. The broad door leading to an adjoining stall was opened. Muyoni explored it placidly. A few days later, while she was out of doors, the barred front of the new stall was covered with sheets of composition board in which three viewing holes had been cut. Our idea was to give her a secluded retreat when birth was imminent. The pair of Masai Giraffes quartered opposite the closed stall were temporarily disquieted by its new appearance, but Muyoni accepted it without alarm. In the weeks that followed she used the closed stall only for defecation, however.

The floors of both stalls were covered with a layer of sand, straw and fibrous litter to provide traction for the young Okapi and to cushion its inevitable falls in its first efforts to stand.

Finally, we readied towels and heat lamps, in case the baby had to be taken from its mother, and alerted the Farm-in-the-Zoo to the possibility that we would need fresh milk every day – all the while hoping that none of these things would be needed.

My own tension had built up to such a point that on October 12 I flew out to Chicago to harvest every possible detail about the last days of pregnancy and the birth and subsequent care. Mr. Bean and the keeper of Chicago's sturdy young male were most reassuring.

ly flopping ears seem to characteristic of new-born is. Our baby was ten hours hen this picture was made.

From the very beginning the baby was more wary than its mother – it usually took shelter behind Muyoni or in a corner.

As I sped homeward across the darkened continent that night, Assistant Head Keeper Matty Rolla began what was to be a round-the-clock vigil outside Muyoni's stalls.

The next day, Tuesday, was another day of waiting for nature to take its course. Keeper Neil Dapolite was able to squeeze a few drops of milky fluid from Muyoni's udder, but two hours later the same procedure yielded only a clear liquid. We had hoped to get enough milk to have it analyzed, so we could make up an intelligent formula if necessary.

Tuesday night Matty again kept watch. I slept lightly at home, waiting for the phone to ring. It didn't.

The notes that follow are paraphrased from the journal the keepers and I kept in the waiting period.

Wednesday, October 14

Muyoni's udder seems fuller than before and her appetite for clover hay has increased. We think we see subtle changes in her appearance, but these are so slight that we may well have missed them before. She seemed listless when Neil brushed her in the afternoon.

I stood watch through the night. By 6 P.M. Muyoni was her old self again. Of all the animals in the building, only the Okapis and the Gerenuk accepted my presence quietly. Only with an effort did I remember to shuffle my feet and hum as I moved around. One forgetful moment of tiptoeing and I would find the Greater Kudu poised for flight into the closed door of his stall.

I don't remember what made me think the moment was at hand, but a little after 10 o'clock I phoned Neil and he arrived at 10:30. It might have been the Okapi's heavy, labored breathing, a new development.

Thursday, October 15

False alarm. I sent Neil home some time after midnight. The Antelope House is alive with strange sounds at night, from the muted gurgle of a Giraffe bringing up its cud, through the many-toned clicks of hooves on concrete, to the

crash of a Sable Antelope jousting with his door. The faint light at the Okapi's stall is barely enough for watching Muyoni and does not penetrate to the far end of the building. Still, after a while, the sounds begin to sort themselves out and it is possible to make a kind of game of associating them with their creators. During the times that seem hours long, while the Okapi just stands quietly, monotony is an enemy and the "sounds game" is a useful employment of the mind. At 3:30 A.M. I stretched out on the cot for a moment.

ıe left is the spare stall, ded up to give Muyoni se- ɔn, in which the baby was lly born. Peep-holes had cut at different levels so the ess of birth could be seen.

Measurements were obtained when the youngster was ten hours old. Here Mr. Davis holds a tape for shoulder height while Neil Dapolite soothes the baby and Matty Rolla records it all.

It was two hours later when I awoke to find someone sitting beside the Okapi stall in the half-light of early dawn. It was Matty Rolla. He, too, was beginning to feel like an expectant father, and couldn't stay away. Muyoni was lying quietly, chewing her cud.

A pre-birth discharge was noticed at 7 P.M., and again at 10:30 P.M., but not enough to indicate that birth was imminent. I slept at home, planning to be at the Antelope House by 3:30 A.M.

Friday, October 16

Slept through the alarm clock and arrived at the Zoo at 6 o'clock. Muyoni was increasingly restless all day and so were we. From 8 P.M. onward she gave the appearance of being bewildered.

Saturday, October 17

At 12:30 A.M. we resolved to take turns napping. I was to sleep first, but a minute or two later Neil called me. Birth had begun and one forefoot of the baby had emerged. I telephoned for our Veterinarian, Dr. Gandal, and Matty Rolla.

The calf began nursing when it was less than 3 hours old. Shown here, it is ten days old.

Half an hour later both forelegs had emerged and then, to our dismay, Muyoni entered the closed stall and lay down in a position that hid the emerging calf from our view. At 1:45 A.M. she stood up and turned to face the rear of the stall. To my horror, the calf's legs no longer protruded. Although I knew (or thought I knew) that once begun, the process of birth does not reverse itself, it was plain that this time it had — but half a second later my flashlight disclosed a dark and almost shapeless mass in the rear of the stall. The calf, of course!

A feeble movement told us that the calf was alive. Minutes later he held his head erect. Muyoni cleaned her calf for the next half hour and, when he was 45 minutes old, the baby got to his feet. Half an hour later he took his first tentative steps and when less than three hours old he nursed successfully. Muyoni remained her usual tranquil self through this crucial period. The same could hardly be said for us.

* * *

The rest is anti-climax. None of our emergency provisions were needed. We kept watch for the next three days, taking detailed notes, but all was normal. The calf was sturdy, strong and willful, lively enough to give his keeper a good kick. When less than 12 hours old he stood 29¾ inches at the shoulder. We estimated his weight as 35 pounds. He is much darker than his mother; almost black, with white stockings and thin tan and white stripes on the hindquarters. The sides of his face are buff, unlike the gray of both parents, but this color may change with age.

Muyoni came to us from the Belgian Congo on November 1, 1956, as a 465-pound adult. Bilota, the father, came on June 15, 1949, and was also adult. He is inclined to slash at Muyoni with his horns, so they were together only during daylight hours, when they could be watched. Thus we know the date of mating exactly and can state that in this pair of Okapis, at least, the gestation period was precisely 14½ months, or 441 days.

THE MATAMATA

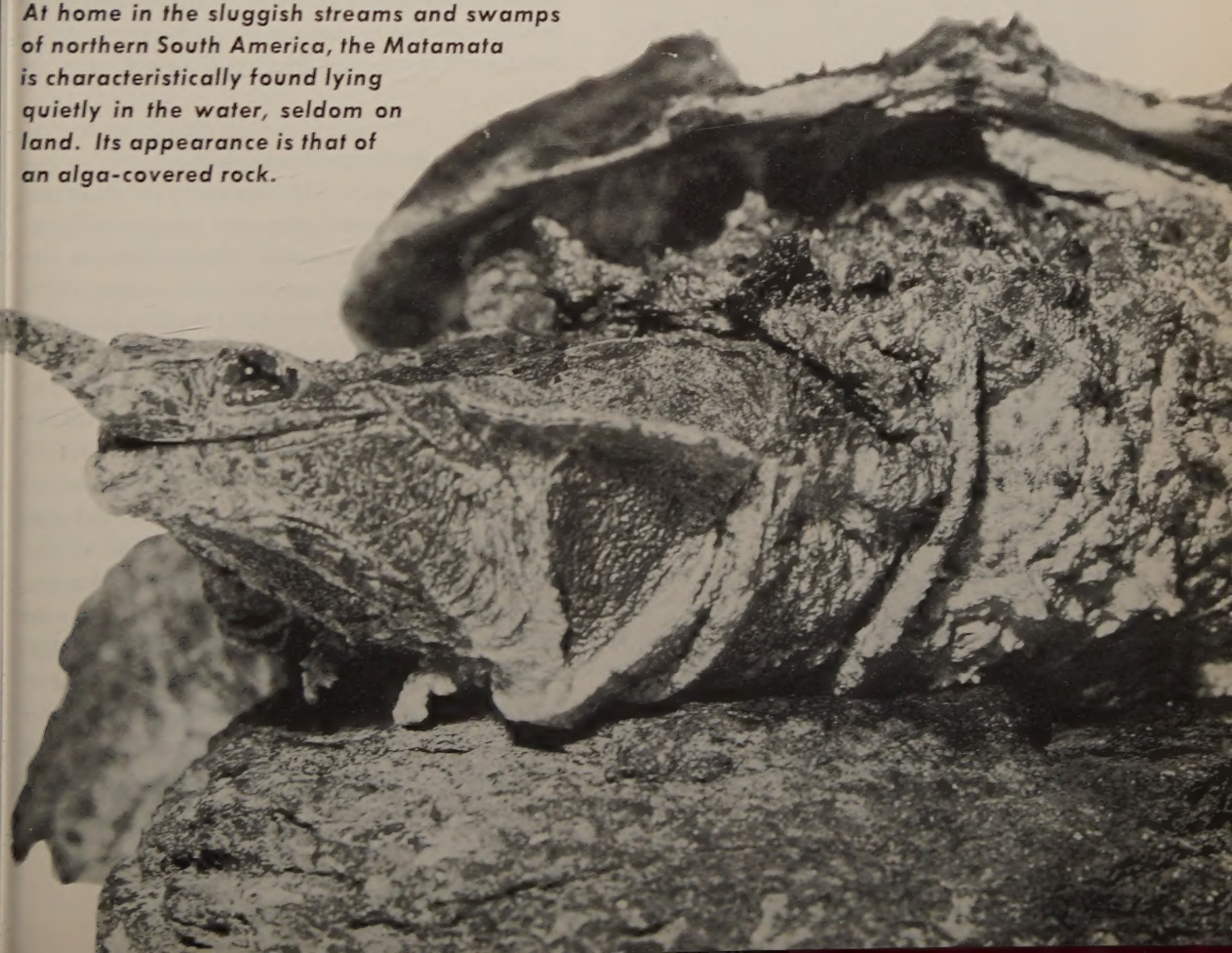
Surely *All* Turtles Can Swim . . . ?

By JAMES A. OLIVER

Director of the American Museum of Natural History; former Curator of Reptiles at the Bronx Zoo

THE EMINENT HERPETOLOGIST, Archie Carr of the University of Florida, once published a key for the identification of the freshwater fishes of Florida in which he dealt with one species by the simple yet forceful statement, "Any damn fool knows a catfish." Today the author of this classic phrase is one of the world's authorities on turtles, and he would doubtless subscribe to the use of a similarly emphatic statement about the swimming abilities of turtles. Everyone knows that turtles can swim — *all* turtles, not just those that live in water. Some of the land-dwelling forms may do so with little grace or efficiency, but they do swim.

The Reptile Department of the Zoological Park has always accepted this generalization without question. That is, it always did until this past summer when its faith in the all-inclusiveness of the statement was shaken for a brief period. It all started when Head Keeper of Reptiles Stephen



At home in the sluggish streams and swamps of northern South America, the Matamata is characteristically found lying quietly in the water, seldom on land. Its appearance is that of an alga-covered rock.

Spencook put a small Matamata (*Chelus fimbriatus*) in the Sideneck Turtle tank in the Reptile House. The turtle had been living in the "Turtle Pond" in the building for five months and was apparently in good health. The water in the Sideneck's tank is about 20 inches deep in all sections but has a rock shelf on which turtles can climb with ease. The "Turtle Pond" has a sloping bottom and consequently shallow water on at least two sides.

The Matamata was placed in the Sideneck's tank in the afternoon and was found dead the next morning without any obvious cause of death. A short time later we obtained another small Matamata and placed it in the same tank. This time the turtle was put in its new enclosure in the morning and a little more than an hour later it was noted floating belly-side up about four inches off the bottom of the tank. Mr. Spencook removed it and found it limp and seemingly lifeless. He laid it on a table and manipulated the four limbs to determine whether it was dead or not. The turtle revived and was replaced in the "Turtle Pond" where it got into no further difficulties.

As a result of these experiences and subsequent observations on this turtle, Mr. Spencook came up with a bold opinion that the Matamata could not swim and would drown if placed in deep water. Such a preposterous statement could not go unchallenged. Surely everyone knew that *all* turtles could swim. But Mr. Spencook has long held my respect as the best Head Keeper of Reptiles in the business and I could not ignore his opinion as that of an uncritical or excitable tyro. Still, that a turtle might not be able to swim was too much to believe without proof.

To test the matter, Mr. Spencook, my daughter Patricia Oliver, and I soon ran some simple experiments on the Matamata. We placed it in the center of several different-sized pools where there was deep water. Each time the turtle was put in the water it sank straight to the bottom without any movement of the legs, making no effort to swim. After remaining motionless for 15 to 35 minutes, the turtle would slowly stretch out its long neck and point its schnorkel-like nose toward the surface. Sometimes the turtle would rise vertically and stretch upward so far that it was standing only on one claw of one foot. But never did it try to swim to the surface nor did it ever lose contact with the bottom. Failing to reach the surface in this fashion, the turtle would settle back on the bottom and walk along, occasionally stopping to stretch upward. Finally when it had moved into sufficiently shallow water to reach the

ous stages of the Matamata's attempts to reach surface to breathe are shown here. An explora- of its tank, seeking a shallow place, is first. comes a stretching upward toward the surface, aneuver many times repeated. In one tank it was to reach the air by standing on one hind foot.

surface, it would breathe. If there was any object on the bottom, including another turtle or even an alligator, the Matamata would climb on this and stretch toward the surface.

We repeated these observations a number of times in various pools with differing depths of water. At no time could we induce the turtle to swim. Could it be true that the Matamata couldn't swim? Or was it so lazy that it simply didn't want to make the effort? Perhaps our turtle was just an individualist and it wasn't representative of the species at all.

The Matamata is an inhabitant of sluggish streams and swamps of northern South America, from the Andes east to the Guianas and southward throughout the Amazon Valley. It rarely comes out on land and characteristically is found lying quietly in the water. When it moves, it does so slowly by walking along the bottom. The over-all appearance of the turtle is that of a non-

descript, flattened, alga-covered rock. Closer inspection reveals a jagged, oval shell, four small webbed and clawed feet, a short tail, an enormous long, thick neck and large head. The skin over most of the head, neck and body is covered with rugosities and fleshy projections. Could it be that this bizarre turtle had become so completely adapted to living quietly like a camouflaged rock on the bottom of shallow bodies of water that it was unable to swim? This called for further investigation.

I soon obtained four more of these interesting turtles and we determined to settle the matter once and for all. We placed the two smaller turtles in separate aquaria and gradually increased the depth of water until it was impossible for them to stretch up to the surface. The two larger turtles were placed in a large tank with a depth of water of two feet. This tank had several large, rounded boulders on the bottom, but the turtles could not reach the surface vertically from the largest of these.

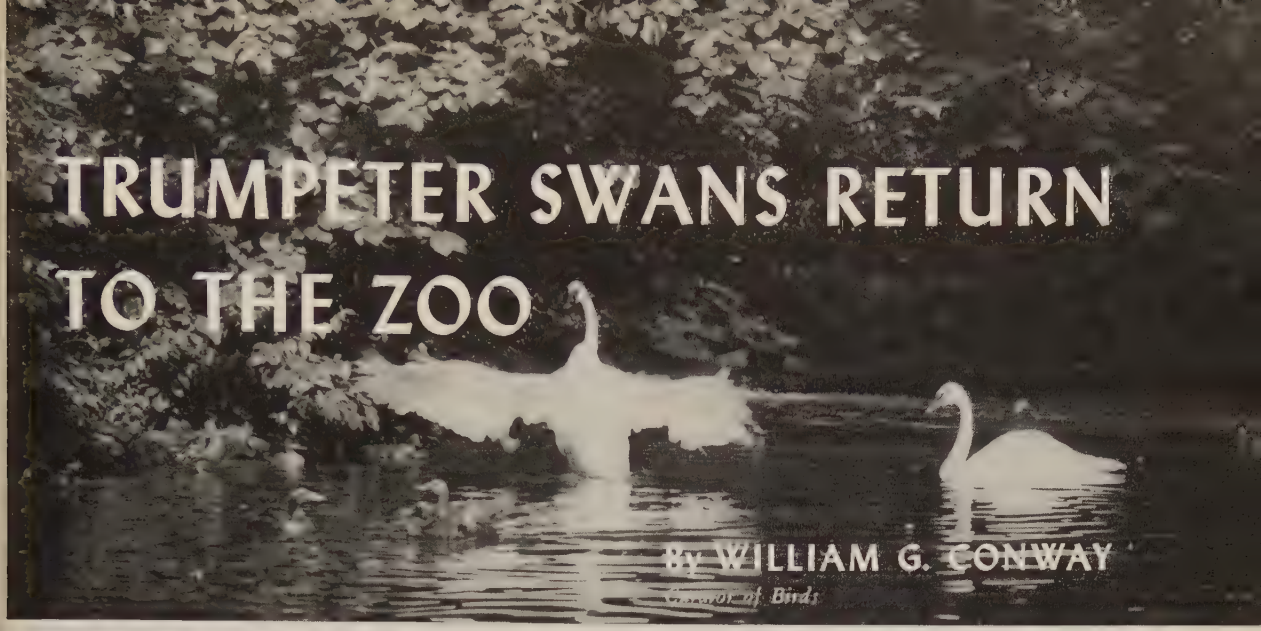
The behavior of the turtles in the latter tank was most interesting. When first placed in the water, the larger one sank to the bottom and remained motionless for more than half an hour. Then it crawled slowly around the tank, climbing up on each large stone and stretching toward the surface. This was continued for two hours and 35 minutes without a breath. At this time it laboriously and awkwardly but vigorously climbed up the side of the tank, seeming to dig its claws into minute irregularities on the partially painted masonite wall. At last it reached the surface and took a breath. However, neither observer believed its movements could be described as swimming. An hour and five minutes later this same turtle repeated the performance.

It still looked, incredibly, as though the Matamata could not or would not swim. The small legs seemed unable to give sufficient propulsion to the heavy shell and body. In the meantime my daughter had been watching the two smaller turtles in the glass aquaria. One of these with a dorsal shell length of five and a half inches could still reach the surface to breathe at a depth of 11½ inches by standing vertically on one hind foot. The other, a slightly smaller individual with a dorsal shell length of five inches, could reach to only about 11 inches. At a greater depth it would vigorously push or jump vertically and reach the surface. Then after being under water 56 minutes and 30 seconds this little turtle laboriously *swam* to the surface from the vertical stretching position. *This* Matamata could and did swim!

The smaller of the two turtles placed in the large tank at a depth of two feet exhibited the same ability. It could swim in a vertical position, but only with considerable effort and *only* after trying to reach the surface by stretching. Later we increased the depth in this tank to three feet and the turtles still could swim to the surface to breathe. We never were able to induce them to swim horizontally. They swam vertically only when they appeared to be under great stress and could reach the surface by no other means. However, all four individuals did swim when their need for air was great enough.

One series of observations reported recently in the literature is of interest in this connection. When Charles A. Reed was in the mountains of northern Iraq doing archeological work he noted that the Caspian Turtles (*Clemmys caspica caspica*) inhabiting a spring and short stream in the area did not swim. When they came to the surface to breathe, they did so by climbing up the muddy bank to the surface. Reed put one in a bathtub and gradually raised the level of the water until the turtle could no longer reach the surface even by standing vertically against the side of the tub. After twenty minutes the turtle was "acting in a manner I would describe as frantic," but at no time did it swim or endeavor to do so.

It is possible that the turtle in the tub was not put under sufficient stress to make it swim. In the light of our experience with the Matamata, I believe this must be the case. Certainly Caspian Turtles from other areas swim and do so quite well, as Reed noted and as we have verified with specimens in the Zoo. It is interesting, however, that the turtles in Iraq did not swim customarily. How widespread this behavior may be in turtles is not known. Certainly there are other species that characteristically walk along the bottom rather than swim. But as far as we now know, there are no exceptions to the generalization that all turtles *can* swim — say it however emphatically you will.



TRUMPETER SWANS RETURN TO THE ZOO

By WILLIAM G. CONWAY
Curator of Birds

SIXTY YEARS AGO Dr. William Beebe prepared an 8- x 10-inch sheet of paper with the heading "Catalogue, *Olor buccinator*, Trumpeter Swan," and entered under "Arrivals," "Three specimens, Idaho — July 15, 1899." It is thus a matter of record that the Trumpeter Swan was among the first specimens acquired by the New York Zoological Park, even before its formal opening in November, 1899. Thereafter the species maintained residence in the Park almost continuously until September 15, 1928. With this last entry, the death date of our last specimen, there was an air of finality, for in 1928 it seemed unlikely that the gradually-yellowing Trumpeter Swan record sheet would ever be taken out of the files for another entry. The Trumpeter was known to have once bred throughout an immense area from southern Alaska to California, east to Manitoba, Minnesota, Indiana, Iowa, Nebraska and Missouri, and to have wintered south through the Mississippi Valley, Illinois, Louisiana and Texas. But as early as 1910 it was thought to be extinct in the United States, although it was still found in Canada and Alaska. Eventually a very few pairs were located in Yellowstone National Park, but the future of the bird appeared bleak indeed.

Trumpeters had disappeared for a variety of reasons. Much of their original nesting territory had been appropriated for settlement by man. They were not so wary as the Whistling Swan and were easily killed by gunners. Their great size made them tempting and easy targets. Size gave them an obvious value as food, and it is even said that numbers were killed just for their skins, which were used to manufacture powder-puffs.

In view of all this, it is wonderful to be able to report that the Trumpeter Swan catalog card, after a rest of nearly thirty-one years, is active again. It has a new entry: "Two Trumpeter Swans, July 18, 1959, deposited by the Fish and Wildlife Service — collected near Monida, Montana."

By 1935, about sixty Trumpeters were known to survive in the United States in Montana's Red Rock Lakes and Wyoming's Yellowstone Park. In that year the Fish and Wildlife Service established the Red Rock Lakes Migratory Waterfowl Refuge and in the excellent sanctuary thus provided the birds have made a marvelous comeback. The Service has maintained a careful watch over the swans and taken a census of the population regularly. By 1949, the United States' population had increased to 451, and Daniel Janzen, Director of the Fish and Wildlife Service, notes that the 1958 census revealed 697 birds. The Canadian and Alaskan population numbers about 900, so that there are now approximately 1,600 Trumpeter Swans in North America. Survival of the Trumpeter in the United States seems assured for many years to come because of these timely conservation efforts.

In addition to providing sanctuary at Red Rock Lakes, the Fish and Wildlife Service has drawn upon the successful Montana population in attempts to establish other wild populations. "Seed-

ing" has been tried in Oregon, Nevada and Wyoming, but as yet only the Wyoming introductions have met much success. Jean Delacour worked with the Service from 1944 to 1947 on this program and reports in his book, "The Waterfowl of the World," that inadequate captive breeding facilities and the difficulty of obtaining experienced and permanent swan keepers led to the failure in Oregon and Nevada. However, the Service has indicated that the seeding program will continue and we may probably look forward to even further increases in Trumpeter numbers.

Several years ago Mr. Delacour noted that "the protected population of Trumpeters in the sanctuaries of Montana and Wyoming has reached saturation point," and in a recent letter Mr. Janzen comments, "An analysis of the recent population trend has shown that our objective of maintaining the wild population (in the refuge areas) at the maximum sustained level which the limited environment is capable of supporting has been achieved."

Careful protection has thus made it possible, once again, for millions of Zoo visitors who cannot see the wild population to view the largest of the world's waterfowl and heaviest of North American birds. Not only is the Trumpeter the largest of the world's swans, but it is among contenders for the title of "the largest flying bird," for Trumpeters may weigh more than thirty pounds, have an over-all length of more than 65 inches and a wingspread exceeding eight feet. The Trumpeter takes its name, of course, from its wonderful voice, among the most powerful and perhaps the most striking of all North American animal noises. Gabrielson and Lincoln, in their recent book, "Birds of Alaska," characterize it best: ". . . great sonorous but musical trumpetings, placing it as the most striking bird voice on the continent." To this we must add a fear-inspiring hiss, noted when we have handled or examined our two birds.

Of course, we hope we may some day breed our Trumpeters, for they have bred readily in captivity in the past. Young were raised as early as 1870 in the London Zoo and as early as 1885 in Paris. The most successful breeder of Trumpeters was Mr. F. Blaauw, in Holland, who raised many birds over a period of more than thirty years. On Mr. Blaauw's death, according to Mr. Delacour, the birds were bequeathed to the Duke of Bedford in England, where they all died between 1939 and 1945 through lack of food during the war. Our last Trumpeters were received from Blaauw in 1921. After the loss of the Blauuw stock in England, there were no Trumpeters in Europe until 1952, when the Canadian Government presented several birds to the Severn Wildfowl Trust. Two female cygnets were added to the group in 1956, and Peter Scott reported in September of this year that one of these young birds was incubating eggs. Within the next few years the birds may again be established in European collections.

In 1938, C. L. Sibley bred a hybrid between a cob Whooper Swan and a pen Trumpeter. Hybrids with Whistling and Mute Swans have also been reported, and at least one hybridization with a Canada Goose is on record. The Fish and Wildlife Service has cautioned Zoo recipients of Trumpeter Swans to take care to avoid hybridization.

Strangely enough, until this year no captive Trumpeters had bred in North America. Then, in June, five cygnets were hatched at the Delta Waterfowl Research Station, Delta, Manitoba. Four of the cygnets were taken from the parents and hand-reared, and the fifth, which hatched two days after its siblings, is being reared by the parent birds. An important consideration in successful waterfowl breeding is the background of the female parent. Aviculturists have repeatedly noted that wild-caught adult female ducks, geese and swans are usually very reluctant to breed in captivity. Females reared from eggs laid by wild pairs or taken while very young usually breed readily, as do captive-bred females. Wild-caught adult males usually show no such parental restraint. In this connection it is interesting to note that the Delta female parent Trumpeter was received as a cygnet, only a few weeks old, for hand-rearing, though the male is a wild-caught adult. Unfortunately, the male Trumpeter is the younger of our pair, still showing the pale feet and a few brown feathers of an immature bird's plumage, while the female appears fully adult. Barring accidents, we look forward to a long residence with our Trumpeters, for swans are long-lived, and there is one captive record of 32½ years for a Trumpeter.

When the Takin stepped out of her shipping crate in the Bronx Zoo, two friends who had known her in Burma were on hand to welcome her to New York — Mrs. Ann M. Milton and her son, Eric.

A RARITY FROM BURMA—

The First Takin In America

By ANN M. MILTON

EDITOR'S NOTE. The young female Takin (*Budorcas taxicolor*) whose acquisition by the New York Zoological Society was recorded in the March-April issue of *Animal Kingdom,* was released from Federal quarantine on October 30 and went on exhibition in a corral at the Antelope House the same day. She is the first Takin to be exhibited in the United States.

All accounts of the animal we received from Burma and the quarantine station in Hamburg (where she underwent 60 days' detention before being flown to New York) had stressed her liking for being with people. There was no doubt about it when the bamboo shipping crate was opened and she walked out into the corral. With complete unconcern she strolled through a group of photographers, explored her new home and then stood quietly for pictures with Mrs. Ann Milton, whose husband, Oliver M. B. Milton, obtained her for us in Burma. Four-year-old Eric Milton, who had often played with her in Burma earlier this year, petted her and fed her wisps of clover

The Bronx Zoo's Takin was captured just beyond this mountain range in North Burma. The highest peak rises 14,300 ft., and the whole range is used by local tribes for hunting Takin and Serow.
Oliver M. B. Milton Photo

hay. When she had had enough posing, she simply strolled away, explored some more and then stood for more pictures. Visitors outside the fence seemed to attract her, and several times she stood on her hind legs with forefeet braced against the fence, as if to climb. Her talent for climbing — or jumping — is giving us some concern, for the fence around the corral is only 7½ feet high, and the winter shelter being designed for her will have to be far enough away from the fence to prevent a leap out.

Coming as she does from the high mountains of the border between Burma and China, New York's winter weather should be extremely comfortable for the Takin. We expect to give her only a simple shelter against sleet and freezing rain.

Food has proved to be no problem. Leaves and grass are presumably the animal's chief foods in the wild, and in the Zoological Park she is eating a ground-grain mix, oats, sweet potatoes, Irish potatoes, carrots, cabbage and clover hay. She weighed 155 pounds on arrival. Male Takins are said to reach a weight of 600 to 700 pounds, but females are smaller. At the end of October our Takin was about 20 months old.

WHEN I FIRST SAW the Takin she was roaming freely through the underbrush and bamboo fencing of the small Rawang village of Sangawng, eight miles west of Putao, Burma's northernmost town.

She had been caught by hunters from this village in an area about ten days' walk northwest, on the borders of the Mishmi Hills. Being no more than two months old at the time, she was carried on their shoulders back to Sangawng.

Here the houses are built of interwoven lengths of split bamboo. With heavily thatched roofs, they stand on posts usually five or six feet off the ground. Domestic animals find shelter underneath, in the storage area for firewood, baskets, extra thatch and a rice-pounder. The people live simply, by fishing, hunting, cultivating and weaving.

The Burma Wildlife Survey team of my husband, Oliver Milton, and Richard Estes, walking up from Putao, arrived at the village one afternoon in February of this year for a dual purpose. One was to arrange for a two months' survey in the snow mountains that separate Burma and Assam and the other was to dispatch this small Takin to her new owner, the Bronx Zoo.

Eric, our young son of three, and I were greeted by the men and a group of Rawangs some hours later. Our pace had been slowed by three ox carts laden with kit and Eric as sole passenger.

That same evening I saw the young Takin grazing outside a stake fence on the main village path. It was just possible to make out her dark brown coloring accentuating a broad, dun, saddle patch. Large eyes were set in a neat head and her black face ended in a soft but Roman nose. A certain sign of a definite will of her own, I thought. Small, pointed horns had protruded an inch or so. The widely separated hoofs reminded me of Chinese women I had seen with bound feet. The Takin's were so small and high for the thickness of her legs that they gave her the appearance of walking on minute high heels. Her back, with pronounced goose rump, gave a sudden slope to the tail from the withers, which only measured twenty-seven inches off the ground. The legs were heavy-set and well covered. It seemed to me that she looked much like a goat from the front and a bear from the rear.

Takins range through rhododendron forests on the lower slopes of the mountains. Here, at 8,000 ft., the Burma Wildlife Survey encountered numerous Takin tracks and droppings.

Oliver M. B. Milton Photo

In the morning Eric and I went off to find the little animal, which we saw grazing with one of the cows in a field at the end of the village. A small boy drove her up to us and there she stood quietly for a few moments. With her head held in a horizontal position, she paid no attention to the fact that three small Rawang boys and Eric were leaning on her back. I patted the luxurious growth of her rather long, soft, hair and ran my hands along the thick and muscular neck to her large ears and strong cheek bones covered with hair that was almost black. Seemingly bored with attention, she moved off a few paces with long, sure, strides and started to graze on the young leafy vegetation she enjoyed. I smelled my hands, aware of her definite but not unpleasant musky odor.

She treated the children of the village with a measure of acceptance, but when they annoyed her too much she would walk along in front of them and then suddenly, with almost unbelievable speed and dexterity, dart through a narrow opening in the bamboo fencing surrounding one of the houses.

When we first arrived in Sangawng I noticed that the early hours of her days were spent grazing with some cows, calves and goats. Eventually they would all lie in the coolness of the soft dirt

Above — Eric Milton (foreground) and children of the village made a pet of the Takin. Below — Finishing a meal of rice gruel at the airstrip at Putao. Food generally kept the animal quiet.

R. D. Estes Photo

Above — Bedded down for the night on the porch of a Sangawng house. Right — Director U Kyaw Thein of the Rangoon Zoo took a great liking for the Takin while it was in the Zoo.
R. D. Estes Photo

under the houses. At night the Takin would sleep on the "porch" of one house, where she would lie like an enormous dog, seemingly oblivious of any disturbances. As time went on it became quite clear that she thoroughly enjoyed human companionship.

Her firm attachment for the cows, and to one in particular, gradually dwindled and she was seen more often on her own or grazing further away from them. The goats, who were always being chased by the local dogs, treated her with more aggressiveness, but because of her bulk and strength they always backed down in any real argument between them. It was most amusing to see the Takin with her tiny horns trying to butt the goats and then to watch them all scramble up the bamboo ramp and onto the low "porch" of one of the houses. Here they all stood to gain a better view and sparring advantage over the goats still left on the ground.

The Takin had a will of iron combined with strength and agility that amazed us all. Once she made up her mind to do something, or go somewhere, there was little that could change it. The village dogs would occasionally bark mischievously at her, but they soon gave up; instead of running like the goats under similar circumstances, she would lie or graze where she was, paying not the slightest attention to them.

Many unsuccessful attempts were made to get her airlifted out of Burma for a quarantine period in Hamburg before the monsoons and the very hot weather arrived. Finally it was thought best to keep her in Sangawng, if no other flights could be arranged, until our return from the North. At that time a concentrated attempt could be made so she would not have to stay in the terrific heat of Rangoon while awaiting a connecting plane.

During the first week of April we returned to Sangawng. Eric was carried in a basket and we walked for two long days over what seemed at times a nearly impassable trail. The penetrating wetness of February had perceptibly changed to the hot, sticky, oppressive, pre-monsoon weather. The Takin now grazed in the early mornings and evenings, spending the rest of the day panting under one of the houses. We were all concerned for her health should she have to spend any time at all in Rangoon.

But this proved to be unavoidable, for when she finally arrived in Rangoon at the end of April, there was no plane service available to fly her to Germany. Every possibility, for one reason or another, fell through at the last minute. Very kindly and fortunately the Manager of the Rangoon Airport told Oliver that the animal could remain in a small air-conditioned room at the airport for an acclimatization period. A barricade was arranged to close the front opening, there being no door, and the Takin's crate, once placed in the room, was opened after the crowds had dwindled. She peered out, was given some food, which she ate, and then walked into her new accommodation with no bother at all. I heard later from Dick, who had waited up North to make certain she left Putao, that she had entered her crate on the airstrip and made the trip down with the same amazing docility. Measured again, she was found to have grown five inches in just over three months. Her weight was one hundred and fifty pounds. A man from the Rangoon Zoo was on hand the entire time and the Zoo Director also kindly supplied Oliver with her food, thirty-five pounds of green leaves each day. In the cool of the evening, when the temperature might drop to the high eighties, Oliver or the keeper would take her out for a stroll, giving her some relief from the caged area.

In such close proximity to so many human beings, the Takin became increasingly fond of their company, so much so that the keeper found he could barely leave her for a minute. On one unfortunate occasion, when no one was present, the Takin became anxious and in leaping against the steel-expanded barricade, caught one of her three-inch horns in the fence and loosened it. A few days later the horn came off. There was great speculation as to whether it would grow again. Most people thought not, but apparently it has made a certain amount of new growth in the months since then and may some day be almost as large as the undamaged horn.

After three weeks of imposing on the airport's hospitality and much needed space, Oliver moved the Takin one evening by truck to the Rangoon Zoo. The air was a bit cooler now — for Rangoon — and the Director had designated a shady corner for her comfort. Here, too, she was given the greatest care and attention until an airlift was arranged some weeks later.

During her stay at the Zoo she became internationally known and endeared herself to a great many visitors. Judging by photographs I have seen, Director U Kyaw Thein also grew very fond of her. No one knew for certain how long the Takin could endure the heat of Rangoon as a sudden change from her mountain home, but with only slight loss of weight she remained in good condition for her entire stay at the Rangoon Zoo, thanks to the excellent care she received there.

A combination of unlimited efforts on the part of Oliver and Dick proved unshakeable and finally as a reward for their patience and perseverance KLM Royal Dutch Airlines was persuaded to remove fifteen seats from one of its passenger planes and on July 26 the Takin was airlifted to Germany, the first leg of a long trip to the USA, the Bronx Zoo and her new home.

The Great Tinamou of the Tropical Forest

By ALEXANDER F. SKUTCH

San Isidro del General, Costa Rica

I STOOD ON A WOODED RIDGE, amid palm trees whose slender, soaring trunks thrust feathery crowns into the high canopy of the rainforest. Around me grew clusters of low, spiny palms, with ribbed fronds that tapered to tips beneath which brown hermit hummingbirds fastened their downy nests. My eyes followed the graceful curve of a woody vine upward to the lofty bough from which it hung, like a tree trunk that had lost its power to stand erect. The forest dripped after the heavy afternoon shower of early May; but the sun, sinking low above the wooded summit of the opposite ridge, sent nearly horizontal rays through a gap in the massed clouds.

Far above me in the sunlit tree tops, a party of toucans were singing their vespers, throwing their great yellow and chestnut bills skyward as they began each high-pitched verse. A Black-faced Antthrush, walking daintily over the leaf-strewn ground, whistled thrice in a full, mellow voice. From the ferny undergrowth came a Brown Manakin's exquisite whistle, ascending in three stages. A sweet, slight call revealed the presence of a Black-striped Woodcreeper, clinging unseen to some high trunk. The cicadas, which through the dry early months of the year had filled the woodland with their strident sounds, mingled their sharp sizzles with the liquid notes of the birds. Doomed to perish beneath the hard rains now beginning, these insects introduced a note of

The Great Tinamou is about the size of a Guinea Fowl but unobtrusively marked. Heavily muscled, it can rise fast and fly strongly under perfect control even among thick forest trees.

mutability and death into the joyous woodland chorus.

Suddenly a strong, solemn voice swelled through the forest, overpowering all its slighter sounds as the sunshine dims a lamp. Now on one side, now on another, the organ peals were repeated, saturating all the woodland with pure sound. In a song consisting of two full, long-drawn notes several times repeated, the Great Tinamous (*Tinamus major*) were heralding the approach of night.

For a few minutes the tinamous' whistles pealed intermittently through the forest, then they fell silent for the night. As I walked homeward along a narrow, fern-bordered path, the last of the pyrophorus fireflies, creatures of the dry season, traced brilliant, erratic courses through the trunks of the great trees -- my trees. Recently I had bought this forest, along with the adjoining clearings and small plantings of a farm newly carved from the wilderness in southern Costa Rica, and close beside it I had built a house which I hoped would be my home for many years.

Sometimes as I followed a forest path I met a Great Tinamou, a bird the size of a Guinea Fowl, with a stout, faintly barred, olive-brown body, a slender grayish neck, a small chestnut head with large, dark eyes, a straight bill of moderate length, and a negligible tail. After walking ahead of me for a short distance, the tinamou would quietly vanish into the surrounding undergrowth. These birds were almost always alone, although once I met a parent who led three half-grown chicks for a good way down a forest road before they veered aside into the underwood.

More often, especially while walking through pathless woodland, I would become aware of a tinamou, not by sight, but by a startlingly loud burst of wingbeats as the heavy bird rose from amid screening herbage and flew rapidly away between the tree trunks, to alight at some point beyond my vision.

Although the abrupt rising of the heavy tinamou seems to demand an effort too violent to be under perfect control, I have never known the bird to strike against an obstacle, as, according to W. H. Hudson, the Spotted Tinamou of the open pampas of South America frequently does, with fatal results. Any tendency by a forest-dwelling bird to collide with the trees that closely surround it would be sternly suppressed by natural selection. In Panamá, Frank M. Chapman saw a Great Tinamou fly up in this way when stalked by a Tayra.

One does not often see a bird as large and shy as the tinamou at ease in its natural setting, but years ago in the forests of Panamá I enjoyed this unique experience. I was spending the morning in my little wigwam of brown cloth, watching a Yellow-thighed Manakin attend her eggs, when I noticed the tinamou about thirty feet off. For a long while it walked around in small circles, from time to time picking up something edible, but never quitting one small area. I wondered what the attraction of this particular spot of the forest floor could be, but I did not wish to emerge from hiding to investigate.

Presently a Brown Dendrocincla, next a pair of Spotted Antbirds, arrived to accompany the tinamou, and from tree trunks or saplings dropped to snatch something from the ground, then rose at once to their low observation posts. This behavior, typical of followers of army ants, assured me of their presence, long before they came close enough to be distinguished. The tinamou was picking up the insects and other little creatures driven forth from the ground litter by the hunting ants.

I had known the tinamou for years before I ever saw it elsewhere than on the ground or on the short, low flights it makes when disturbed. As I passed through my forest one afternoon in September, a tinamou rose from the undergrowth to a stout horizontal limb of a tall tree, forty or fifty feet up. Here it stood for so long that I thought it had gone to roost, although another hour of daylight remained; but when I returned ten minutes later, it had vanished.

The following April I stood quietly in the forest as the day waned, watching a low, globular nest in which I hoped to see an elusive Nightingale-Wren retire for the night. As the light faded, a tinamou flew into a neighboring small tree, to alight on a nearly horizontal bough a few inches thick and about twenty feet up. This was at the enchanted period of the twilight when the tinamous were raising their voices here and there in the distance; but the bird in the tree stood silent and motionless.

In such forest as this — which happens to be in the rain-forest of Honduras, in the Great Tinamou's range — the bird is perfectly at home. This shows the base of a huge silk-cotton.

When the Chestnut-mandibled Toucans had finished their vesper chorus and it was nearly dark in the underwood, I advanced cautiously toward the tinamou's tree. Since the bird gave no evidence of alarm, I grew bolder and went closer. Throwing the beam of my electric torch on it, I moved all around and beneath it, keeping it always in the circle of light; but its only movement was to turn its head. The reflection from its eyes was white, not ruby like that of the Pauraque of the neighboring clearings. To judge by the brilliance of its eye-shine, the tinamou sees fairly well at night. I wished to learn how it grasped its perch, but my light was not strong enough to reveal this detail. Finally I departed, leaving the tinamou resting peacefully in the very spot where it first alighted.

Formerly, when I was wakeful at night and heard a tinamou calling in the neighboring forest, I was troubled by the thought that it wandered over the ground, exposed to all the perils of the tropical forest. But now I pictured it resting on a high bough in relative security. The Great Tinamou does not join the dawn chorus, and it sings only sporadically through the day, as it does in the night. Its principal period of song is in the evening twilight.

ONE DAY IN JUNE, as I walked through the open woodland near the rivulet at the western boundary of my farm, three big, intensely blue eggs caught my eye from a distance. Save the morpho butterfly's satiny wings, these were the most vivid objects in the forest. They lay near the top of the low bank on the farther side of the stream, at the base of a clump of tree ferns. Although somewhat screened by the heart-shaped leaves of a terrestrial aroid, they were so inadequately concealed that I could see them from a point a hundred feet away.

Refraining from approaching for a closer inspection of these lovely eggs, I marked with a stick the most distant spot from which they were visible. Next day I cautiously returned to my marker, hoping for a glimpse of the parent bird, whatever its kind, as it covered the eggs. But alas! they had vanished, leaving only a few fragments of glossy blue shell scattered around the spot where they had rested on the ground, with no sign of a nest. From descriptions that I had read, I believed them to be eggs of the Great Tinamou, but these were the first that I had myself found.

A decade passed before I found my second tinamou's nest, a shallow depression in the ground litter at the base of a small tree near the forest's edge. The two eggs were unattended and cold, but not far off I saw a Great Tinamou. Two days later there were still only two eggs, cold and wet; but on the third day I found three eggs, still cold. On the fourth day I at last found a tinamou covering the eggs — my first unexceptionable proof of the identity of these lovely objects. While I stood watching the bird from a distance of about twenty feet, it suddenly flew up — directly from the nest, it seemed — and with a great burst of wingbeats shot out of the forest and over the adjoining second-growth thicket. There were still only three eggs, slightly warm. On my next visit, two days later, two of the porcelain-like shells lay near the nest site with big gaps in their sides; the third had wholly vanished. I consoled myself with the reflection that the parent bird had probably escaped, unharmed by the plunderer of its nest, for there were no feathers in the vicinity.

In the forests of El General, the Great Tinamou breeds chiefly early in the wet season, in April, May and June, to judge by the few nests that I have found and the chicks that I have met; but an empty nest which a neighbor once took me to see had eggs in late February, the height of the dry season. Although sets of six or even eight eggs — possibly laid by two females — have been reported from other regions, here I have not found more than four. In early April five years ago I discovered my third and last nest. My attention was drawn to it when a tinamou suddenly flew up, about ten feet away, while I stood watching a Chestnut-backed Antbird. Four eggs lay among loose leaves between two projecting buttresses at the base of a high tree. I did not touch the eggs, and after a few days the tinamou would continue to cover them while I looked at him from a neighboring little-used roadway. He always sat facing the trunk, and fitted neatly into the space between the buttresses.

Much as I desired to place a paint-daub recognition mark on my big tinamou between the buttresses, I doubted whether he would permit such a familiarity, and I did not wish to cause his desertion. But ten days after I found the nest,

nature herself marked the bird in a manner that I thought would be helpful. Rain began in the middle of the morning and lasted into the night. The following noon, I noticed that the dark feathers on the tinamou's rump were matted together and bore a whitish encrustation that was very conspicuous where flecks of sunshine fell upon it. This was evidently a deposit of salts leached from the plumage by the long rain and left after the evaporation of part of the water by the heat of the bird's body. The tinamou's appearance suggested that he had sat motionless, breast against the trunk, since the rain began more than twenty-four hours earlier, without even preening his matted plumage.

At last I had a marked Great Tinamou, and the opportunity for fruitful study was too precious to be wasted. Rather than disturb the surroundings by setting up a blind, I decided to make frequent visits of inspection from the neighboring roadway, along which I could pass without alarming the bird. I began at once, and on seven visits that afternoon, some of them in the rain, I found the same bird sitting.

As the next day dawned, I returned to the forest to continue my observations. As I came in sight of the nest in the dim light, the bird shot up from it with loud wingbeats. Yet I was at the same point where I had always stood; why had he suddenly become more distrustful of me? Advancing for a closer view of the eggs, I found one with a gaping hole in the side and the contents quite eaten away, leaving a conspicuous network of red blood vessels on the white inner surface of the blue shell. Another egg was intact but badly dented in two places; the remaining two were uninjured; and all three were wet and cool. Close beside the nest was a small tuft of pale feathers, evidently torn from the bird's flank. As I reconstructed the course of events, some animal had attacked the tinamou in the night; he had fled, leaving some feathers in the assailant's mouth and possibly denting the egg as he took off; then he had returned in the dim light of dawn, such a short while before my arrival that the remaining eggs had not yet warmed up.

I removed the empty and the dented shells and the blood-stained leaves on which they rested, then placed fresh brown leaves beneath the two uninjured eggs. By midday only one remained in the nest and the empty shell of the other lay two yards away. Could the Coatimundi whom I had met in the vicinity a few days earlier have been the villain in this tragedy? Or was it the weasel that I had also seen nearby?

DESPITE THE VULNERABILITY of its lovely eggs, despite all the poachers who year after year prowl through my forest and the marauding dogs that make it hideous with their howls, the Great Tinamous have managed to survive, although in diminished numbers. Since the Crested Guans (*Penelope purpurascens*) disappeared years ago, they are the largest birds continuously present. It is easy to understand why the terrestrial tinamous have survived better than the arboreal guans. When guans are alarmed, they perch conspicuously well above the ground and yelp absurdly in high-pitched voices, a mode of behavior which is probably discreet enough when hunting Ocelots, Pumas, Tayras or other mammals disturb them, but which in the presence of a gunner is suicidal. But the tinamous rise so unexpectedly from the undergrowth, and dart so rapidly away, that the hunter who would shoot them must be exceptionally quick. The stupid pass; the wise and the wary remain.

With the guans have gone practically all of the big, yellow-breasted toucans, once so abundant in these forests, as likewise the little Red Deer, the Coatimundis, most of the Agoutis and the Tayras. Gone, too, are countless stately feather palms, felled by trespassers who carry off the pound or two of edible tissue at the growing point of each, leaving all the rest of the magnificent growth to rot on the ground. But the Marbled Wood Quail, which hugs the ground even more closely than the tinamou, has, after an interval when it had all but vanished, increased of late, now as shy of man as it formerly was trustful.

Although my forest has suffered much, it has not yet been despoiled of all its treasures. A troupe of White-faced Monkeys still roams through its tree tops, and most of the smaller birds survive in apparently undiminished numbers. Perhaps most important of all, as night falls the stirring chorus of the Great Tinamous still peals through it, proof of its enduring wildness. I think of the tinamou as the soul of the forest.

The new "Tri-pool" has been built between the Aquarium and the oceanside Boardwalk. At the right is the home of "Ookie," the baby Pacific Walrus; Seals at left, Penguins behind.

New Shows Outdoors at the Aquarium

By WILLIAM BRIDGES
Curator of Publications

THREE NEW UNITS in the Aquarium's development plan have been completed and a winter construction program that will add tanks and exhibits has been outlined. Winter is, of course, a slack season at Coney Island — but only in regard to visitors. For the Aquarium's staff it is going to be anything but slack.

The major out-of-doors addition during the fall was the "Tri-pool," a complex of three pools that at the moment are the home of "Oookie," a baby Pacific Walrus, ten Harp and Harbor Seals and half a dozen Humboldt Penguins. They are big pools; the Walrus swims in a crystal-clear sea with a 15-foot radius; the seven Harbor Seals have an oval home 50 feet long and 30 feet wide, and the penguins have a pear-shaped pool 40 feet long

narrowing to 14 feet at the end. A huge circular canopy shades the pools in summertime and we foresee no difficulties on account of heat, for the water that circulates through the pools – either salt or fresh – comes in cold and keeps moving.

It has been obvious from the very beginning of the Aquarium at Coney Island that restaurant facilities on the upper deck were going to be swamped when hundreds – and sometimes a thousand – school children pass through the Aquarium in one day. That mealtime congestion has now been taken care of by the building of a big picnic area, gaily decorated with ship's masts and signal flags. There is table and bench room under the masts and between them for some 300 persons. All the usual light refreshments will be available in a small building in the picnic area itself, from vending machines.

To ease the flow of traffic through the Aquarium's halls, the former entrance-exit has been restricted to an entrance; the exit is now outside the main building, through a new and attractive souvenir building. A series of small tanks will be set up this winter in the entrance lobby, in the space formerly occupied by a souvenir and information desk.

Still other tanks and exhibits – a tide pool, for instance – are being planned for the out-of-doors and will be built by the Aquarium's own people during the winter.

Any modifications that involve moving great amounts of water are slow. But the ones now made and to be made are important and will give the Aquarium a bright and busy look when the Coney Island season begins again this coming spring.

Glass-enclosed on three sides, the souvenir building serves as an exit – a much better arrangement than before, when visitors had to leave the Aquarium by a turnstile at the entrance gate.

Colorful signal flags flying in the sea breeze mark the site of the picnic area unmistakably. The building in the background will contain food vending devices.

CONSERVATION FOUNDATION

George Wall Merck

George Wall Merck was graduated from Hamilton College in 1940. During World War II he served as Operations Officer on Cruiser Staff and Gunnery Officer of a destroyer in both Atlantic and Pacific operations. After the war he worked extensively in Africa and Europe and for extended periods was a resident of Canada, Mexico and Brazil, as a representative and officer of Merck & Company, Inc., manufacturer of pharmaceuticals.

Mr. Merck became Secretary of the New York Zoological Society on June 18, 1959. He was made Secretary of the Conservation Foundation in the same month, confirming in practice his own belief that it is impossible to be a member of the New York Zoological Society and not take an active interest in its younger affiliate.

A director of the American Forestry Association, he is also United States Secretary of the International Council for Bird Preservation and a very articulate exponent of the importance of wildlife conservation.

Pesticide Conference

Aware of rapidly mounting interest both public and academic in the pesticide problem, the Foundation sponsored a conference on "Implications of Increasing Use of Chemical Pesticides" on November 16-17. The conference, made possible by a grant from the Rockefeller Foundation, was under the general direction of Stephen W. Bergen, Assistant Director of Research. Chairmen for the two-day session included Samuel H. Ordway, Jr., Executive Vice-president of the Foundation, and Frank Fraser Darling, Vice-president and Director of Research.

The conference dealt with ecological effects of pesticides, suggested biological control and insect resistance. The purposes of the conference were to identify special situations where further research is urgently needed and programs in which the Foundation might take active leadership in helping to resolve a situation which so evidently threatens wildlife and, indeed, the entire biotic environment. The conference was attended by twenty-two individuals who have had special experience and knowledge in various aspects of this problem. Those attending represented universities in the Untied States and Canada, members of the U. S. Department of Agriculture, U. S. Fish and Wildlife Service and the U. S. Public Health Service, and officials of corporations producing chemical pesticides.

Area Resource Development

The research division will undertake a series of research studies and pilot projects in local areas where pressures and plans are forcing changes in land use. Wallace D. Bowman, Assistant Director of Research, will be in charge of the project. It is proposed to bring local planners together with resource technicians and demonstrate the value of their collaboration in pilot areas.

Because hard-pressed economies in some areas stem from misuse and underuse of resources, it

is believed that conservation knowledge is often overlooked in local and regional efforts to speed up economic development. By publishing research memoranda showing the role of specific resources and resource management in economic planning and development in specified areas, it is believed that this area resource development program will make more efficient the alliance of conservation practices with work undertaken by local groups as well as state and federal agencies. A technical advisory committee will be selected to consult on pilot projects and members of this group will be selected from experts who have had broad experience in local and regional economic growth, resource management, planning, public administration and ecology.

Briefly Noted

Dr. Paul Brandwein, director of Education, has returned from a West Coast trip which included a major address on "The Basic Resource," given before the Outdoor Education Association on October 17 at Idyllwild, California. . . . Third quarter royalties for Foundation films which have been circulated among schools in the United States and Canada amounted to $3,961, the highest in six years. . . . Wallace Bowman attended a forest products marketing and utilization seminar at Lansing, Michigan, November 3-5. He reports the conclusion of the conference to be a need for additional research and aggressive marketing in the wood products industry to assure adequate competition with other industries as well as a better utilization of our wood resources. . . . Requests for copies of "The Pesticide Problem" by John George have been so numerous that a second printing has been authorized. . . . 5,000 samples of the Foundation's test to determine growth of understanding among students on the subject of conservation have been sent to the State of Oregon for distribution among Junior and Senior High Schools in rural, urban and metropolitan districts. This trial run is to ascertain the grade level of efficient administration of the tests. . . . Roger D. Hale was chosen Vice-chairman of the Natural Resources Council of America at a meeting held October 9-10 at Blackwater Falls State Park in West Virginia.

BEHIND THE SCENES

NEWS AND NOTES OF THE ZOOLOGICAL PARK, THE AQUARIUM AND THE DEPARTMENT OF TROPICAL RESEARCH

Jimmy Sets a Record

Jimmy the Kinkajou (*Potos flavus*), a slow and gentle little member of the raccoon family from tropical America, seems to have established a world's record for longevity of his kind when he died of tuberculosis on September 24. He had been in the Zoological Park's collection for 22 years and 18 days, and was adult when he came to us on August 6, 1937.

He lost the sight of his left eye by a child's thoughtless action at the New York World's Fair in 1940, but because of his placid nature he was kept on exhibition and was for several years a favorite among small animals taken to schools by our Education Department. In recent years, as he approached the known longevity record, he was allowed to live a quiet and undisturbed life in the Small Mammal House.

The best previous record is for a Kinkajou that lived in the London Zoo for approximately 21 years and 10 months.

Spectacular New Birds

Three species of birds apparently never before exhibited in the United States have been received from the Belgian Congo through Charles Cordier, the animal collector. Most spectacular is the Giant Blue Touraco, which lives high in the forest trees and is difficult to capture and to keep in captivity. We have two.

The other rarities are Ross's Violet Touraco and the White-crested Hornbill. Mr. Cordier first captured the Giant Blue Touraco in 1948 when he was collecting in the Belgian Congo for the Zoological Society, but never got one out alive.

Brightly but not glaringly illuminated from below as well as above, the new wall exhibits in the Heads and Horns Museum invite attention. Rungius paintings hang on several of the walls.

Heads & Horns Museum Reopened On Zoo's 60th Anniversary

The Zoological Park observed its sixtieth anniversary on Monday, November 9, by reopening the Heads & Horns Museum which had been closed for remodeling since August 1, 1955. The actual anniversary of the Park is November 8, the date on which dedication ceremonies were held in 1899, but the first full day of the Zoo's operations was November 9.

The Heads & Horns Museum, for many years a dream of Dr. William T. Hornaday, the Zoo's first Director, and Madison Grant, a founder and President of the Society from 1925 to 1937, was opened in 1922 to house what was called the National Collection of Heads and Horns. It was conceived of as a "memorial to the vanishing big game of the world," and was soon filled with trophies given by American sportsmen. Some were record heads, or exceptionally good, but many others were inferior duplicates and the two large halls eventually became cluttered.

Under the general supervision of General Director Tee-Van a complete overhaul was undertaken. Preliminary advice was obtained from Dr. James L. Clark, for many years director of preparation and installation at the American Museum of Natural History. Subsequently Samuel S. Webb and the late Alfred Ely of the Society's Heads & Horns Committee began the redesign of the exhibits, and Mr. Webb and Grancel Fitz of the Boone & Crockett Club determined the form of the North American collection. Heads worthy of exhibition were selected by T. Donald Carter of the American Museum of Natural History, and Harold C. Casey of Bangor, Maine, an expert taxidermist, was engaged to recondition the heads, horns and antlers – in much reduced numbers – finally chosen as representative of the large mammal fauna of the world. The result is an attractive, world-wide collection.

IN BRIEF

Dr. Beebe to Trinidad. Dr. William Beebe and the staff of the Department of Tropical Research left by air on October 26 for the Department's field station at Simla, in the Northern Range of Trinidad.

Fall Closings. The Children's Zoo, which opened on March 28, closed on November 11 with an attendance of 339,344, the best in six years. A record for the highest paid attendance in its history was made by the Farm-in-the-Zoo, with 99,308 visitors. It opened April 4 and closed October 12, a month earlier than usual.

Bird Statistics. Having occasion recently to summarize records of the Bird Department, Assistant Curator Davall discovered that the Zoological Park has exhibited 2,942 species or subspecies of birds since 1899. The first specimens were accessioned on May 27, 1899.

Air Conditioning for Reptiles. Air-conditioning apparatus is being installed in the southeast section of the Reptile House. Night temperatures in the tropics often range between 65 and 75 degrees Fahrenheit, considerably lower than the 80-95 degree range of the building that is ideal for many other reptiles. It is hoped that the lower temperatures will stimulate some difficult snakes so that they will feed regularly.

Conway Advises in Jamaica. Curator Conway of the Bird Department spent five days in Jamaica in October as advisor to the Jamaican Ministry of Agriculture on the development of a zoological park in the Royal Botanical Gardens.

Ray with "Calypso." Dr. Carleton Ray of the Aquarium staff spent 11 days aboard Capt. Jacques-Yves Cousteau's oceanographic vessel *Calypso* in October, observing the tests of a new type of "diving saucer" that can be used for exploration, collecting and photography at depths of 300 metres.

PUBLICATIONS OF INTEREST

A NATURAL HISTORY OF NEW YORK CITY. By John Kieran. Illus. by 78 black-and-white drawings by Henry Bugbee Kane. 428 pp. Houghton Mifflin Co., Boston, 1959. $5.75.

John Kieran has been so well known to "bird watchers" of this area for so many years that he has long been an accepted member of that fraternity. When a migrating Lapland Longspur arrived on the parade ground in Van Cortlandt Park, it was he who saw it first. When there was word of an avian rarity in any accessible area, arriving searchers might be certain that a slightly venerable black Cadillac, parked in the nearest available spot, would inform them that Kieran had come before them. With such a background it might be supposed that birds would occupy most of the present volume but actually only 82 pages of a text of 396 are wholly ornithological. For this author is a man of broad interests and in covering the natural history of New York he has missed nothing. From a concise but informative history of the City itself, he moves on through geology, geography and climate to small aquatic creatures, insects, trees, mammals and, finally, to birds. A wide field, to be sure, but covered so skillfully that the budding interest of the novice will not be stifled by long lists of names and descriptions. Instead, there is information enough to stimulate a further quest for knowledge. There need be no doubt as to accuracy, for whenever the slightest question arose, the best authority within reach was promptly consulted; every institutional curator in the New York area must have contributed in some way to this mass of accumulated – and digested! – information. Through it all, there is evidence of the obvious pleasure John Kieran takes in passing on to others some of the enduring fruits of a pursuit which has absorbed so many years of his life. – L. S. C.

COMPLETE FIELD GUIDE TO AMERICAN WILDLIFE: EAST, CENTRAL AND NORTH. By Henry Hill Collins. Illustrated by Russell Francis Peterson, Nina L. Williams and John Cameron Yrizarry. 683 + xix pp., 740 species illus. in color, 800 in black and white, many maps. Harper and Brothers, New York, 1959. $6.95; $7.95 in deluxe flexible binding.

This book attempts to present a combined guide to the land vertebrates and the food and game fishes occurring throughout North America north of North Carolina, Tennessee, Arkansas, Oklahoma and New Mexico, east of the Rocky Mountains. Many marine invertebrates, the sea shells and the food and game fishes, to a depth of 25 fathoms, of American Atlantic and Arctic coasts from North Carolina's northern border to northern Canada are included. Accounts of 1,439 species are presented in the following groups: 454 birds, 192 mammals, 98 reptiles, 76 amphibians, 342 fishes, 149 mollusks and 128 other marine invertebrates.

A fore-edge patch guide makes quick location of major animal groups possible despite the enormous number of species included. As might be expected in such a compendium, the quality of the species accounts varies, and the book certainly owes much to its field guide predecessors. The illustrations vary in quality. The fishes by Nina Williams are well done but the mammals, reptiles and birds are not up to the high standards set by the recent Peterson, Pough, Burt and Conant field guides. – W. G. C.

WATER STREET U.S.A. By William H. Carr. 72 pp., 49 illus. Arizona-Sonora Desert Museum and Charles Lathrop Pack Forestry Foundation, Tucson, Ariz.

Bill Carr, as visitors to the Trailside Museum at Bear Mountain may know (for he made it what it is today), has a genius for getting ideas and information into people's heads. Pushbuttons that deliver a recorded story or actuate some simple device, guages, pungent labels, gimmicks of endless variety and ingenuity are his stock in trade. He makes people *enjoy* learning about nature! Founder and now Director Emeritus of the well-known

Arizona-Sonora Desert Museum, he is the creator of the Watershed Exposition of the Museum, popularly known as "Water Street U.S.A.," which uses a Carr-ful of devices to tell people about water and its influence on their land and lives. This brochure, written by Carr, is a lively guide to the new exhibit in the desert near Tucson.

ALL THE BIRDS OF THE BIBLE. By Alice Parmelee. 279 pp., 64 illus. Harper & Brothers, New York, 1959. $4.95.

The Bible contains some 300 references to birds, some specific but many of the vaguest kind. Certain birds can be identified surely, others guessed at, and around them all Miss Parmelee weaves Biblical stories, legends and straight ornithology. An excellent Christmas present for a bird-watching minister friend.

ZULU JOURNAL. By Raymond B. Cowles. 267 pp., 78 illus. University of California Press, Berkeley and Los Angeles, 1959. $6.00.

Of technical and special-pleading books about Africa there is no end. This is not one of them (although it is, significantly, dedicated to Malthus.) It is a wise, leisurely, sympathetic, understanding journal by a professor of zoology at the University of California who learned Zulu as a missionary's son in Natal, a compound of boyhood recollections and acute and often nostalgic observations made on two visits in later years. Ostensibly it is a book about animals, particularly in the Hluhluwe Valley, but it will be greatly valued by many for its sensitive recapturing of sights and sounds and smells and colors, and its affectionate feeling for the people.

New Members of the New York Zoological Society

(Between September 1 and October 31, 1959)

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INDEX

Figures in **black type** indicate that the reference is to, or includes, an illustration, map or design.

A

A.A.A.S., talks by Nigrelli and Gordon, 31
Actinopyga agassizi,138
Adder, Puff, birth of, 63
Air conditioning, in Reptile House, 189
Amsterdam Zoological Garden, Wisents in, 153
Anas platalea, 30
Angler, North American, disease of, 63
Annie, Penguin, killed by vandals, 62
  offspring of, **63**
Antelope, Nyala, first birth of year, 30
  Sable, in Africa, **27**
Apes, Great, get showers, 94
Aquarium, building program in 1959, 34
  expanded form, **34, 36**
  feeding Sealions, **Cover No. 4**
  new Tri-pool, **184**
  picnic area, **185**
  progress of new units, 157
  research with Sea-urchins, 137
  souvenir building, **185**
  work by Ebaugh & Goethe, 36
    by Goldstone & Dearborn, 36
    by Marco Engineering Co., 36
    by Thomas M. Riddick, 36
Arbacia punctulata, **137, 139**
Armstrong, Edward A., "What Birds' Nests Tell Us," 56
Attendance, at Children's Zoo in 1958, 31
  at Zoo in 1958, 30
Atz, James W., "An Amateur Aquarist Solved It," 19
  paper at A.I.B.S. meeting, 158
  receives doctorate, 63
  "The Long-jawed Wrasse," 88
Australian animals, at Fleay's Fauna Reserve, 43

B

Ballet, Bolshoi, visits Zoo, 65, **93**
Batrachemys nasuta, **49**
Beebe, William, records Trumpeter Swans, 171
  reports from Vermont, 127
  to Trinidad, 189
Bellbird, Mossy-throated, **66, 67, 69, 74-76**
  One-wattled, 67
  Three-wattled, 67
Birds exhibited, 1899-1959, 189
Bison, American, **155**
  calf born, 94
  European, **153, 154**
Bison bison, **155**
  bonasus, **153, 154**
Birds, reared in Zoo, 158
Bogert, Charles M., "Iguana Round-up," 82
Bontebok, in Africa, **22**
Books reviewed:
  "Afrika vom Mittelmeer zum Aequator," 96
  "All About Tropical Fish," 160
  "All the Birds of the Bible," 190
  "Audubon Book of True Nature Stories, The," 31
  "Boy's Book of Turtles and Lizards," 159
  "Complete Field Guide to North American Wildlife," 189
  "Curious Naturalists," 160
  "Elephants," 127
  "Everglades – the Park Story," 160
  "Fishes of the Great Lakes Region," 128
  "Fundamentals of Ornithology," 128
  "Genetical Theory of Natural Selection, The," 32
  "Living Forest, The," 32
  "Mammals of North America, The," 96
  "Natural History of New York City, A," 189
  "Nature Stories from the Vienna Woods," 64
  "Of Men and Marshes," 95
  "Studies on the Structure and Development of Vertebrates," 32
  "Study of Blackbirds, A," 32
  "This Is Nature," 159
  "This World of Living Things," 160
  "Water Street U.S.A.," 189
  "Whooping Crane," 64
  "Wild Tigers and Tame Fleas," 64
  "Zoo Celebrities," 160
  "Zulu Journal," 190
Bounty, on Timber Wolf, 7
Brachyteles arachnoides, comes to Zoo, 127
Brandwein, Paul F., **125**
Breeding, of *Geophagus*, 19
Bridges, William, "New Shows Outdoors at the Aquarium," 184
  "The Monkey House," 77
British East Africa, wildlife in, 50
Budorcas taxicolor, **37, 39-41, 173**
  reaches New York, 157
Buffalo, African, **22**
Burma Wildlife Survey, 37, 174

C

Cacique, Green, nests of, **56, 57**
Canis latrans, 5
  lupus lycaon, **2**, 4
Caracara, Red-throated, **8**
  habitat, **10**
Casey, Harold C., 188
Carter, T. Donald, "The Mountain Nyala," 118
Castro, Fidel, visits Zoo, 65
Cat, Pallas's, **48**
Chaplin, Charles, 116
Cheetah, introducing pair, 63
Children's Zoo, opening date, 63
  attendance in 1959, 189
Chelus fimbriatus, **167-169**
Chimpanzees, enjoy water, **145**
Chinemys reevesii, acquired, 31
Coates, Christopher W., "The Aquarium Is Growing," 34
Colobus, Uele, **Cover No. 2**
Conservation Foundation:
  Alaskan Conservation Research Center, 29
  Alaskan land use, 61
  Animal population control, 92
  Area resource development, 186
  Bergen at water conference, 93
  Bowman at forest seminar, 187
    at soil conservation meeting, 157
    at watershed symposium, 126
  Brandwein, Paul, address on basic resource, **187**
  Buechner returns from East Africa, 157
  Colorado College center, 29
  Cooley on Nuclear Test Advisory Committee, 157
  F. Fraser Darling, **92**
  Film royalties, 187
  Filmstrips demonstrated, 92
    praised, 61
  Forest insect control, 29
  Human fertility problem, 61
  Max Nicholson, visit by, 93
    impressed by Foundation, 126
  Merck named Secretary of Foundation, 126
  Nutrition conference at Arden House, 29
  Ordway report published, 126
  Osborn addresses wildlife group, 93
    at eugenics conference, 61
    conducts food supply seminar, 93
    on water resource committee, 157
    records TV program, 126
  Pesticide Conference, 186
  Protestant Council and conservation ethic, 156
  Snider at New Delhi, 61
  Roger Hale, **156**
    at pulpwood meeting, 61
    on National Resources Council, 187
  Small woodland study, 126
  Spruce budworm spraying, 29
  Television series, 157
    test sent to Oregon, 187
    "The Pesticide Problem" reprinted, 187
    Wallace Bowman joins staff, 93
  Wildlife conference, 61
Conservation, wildlife, in Africa, 22, 50
Conway, William G., "Postscript: The Water facts publication distributed, 126
  Tody in the Zoo," 105
  setting nets, **69, 75**
  "The Mossy-throated Bellbird," 66
  "The Rare and Elusive Picathartes," 14
  to Jamaica, 189
  "Trumpeter Swans Return to the Zoo," 171
Coquette, Tufted, capture of, 71, **72, 73**
Coyote, 5
Crane, Jocelyn, to Europe, 158
Cricetomys gambianus, **124**

D

Dapolite, Neil, Keeper, **165**
  and Gerenuks, **144**
Daptrius americanus, 8
Darling, F. Fraser, **92**
Davall, Grace, at A.A.Z.P.A. meeting, 158
Davis, Joseph A., Jr., "A Giant Pouched Rat in the Zoo," 124
  "An Okapi Is Born in the Zoo," 162
  measuring Okapi, **165**
  "Wisents Again after 42 Years," 153
Deer, White-tailed, **106-109**
  control of, 110
  harvest in U.S., 28
  kill by Wolves, 7
  overpopulation of, 106-110
Demon fish, **19, 20**
Diamondback, Eastern, **142**
Diet, of Cuban Tody, 105
Dowling, Herndon G., new Curator of Reptiles, **158**
  "Rattles and Hisses and Rasping Scales," 140
Duck, Pink-eared, **147-152**
  Red Shoveller, obtained by Zoo, 30
Dunton, Sam, photographs by, **16, 47-49, 111-113, 143-145**

E

Eartheater, **19, 20**
Echis carinata, 140, **141**
Eckelberry, Don, **13**
Elephant, Sudana, moving of, **95**
Elephants, dig water holes, **133**
  poaching of, 50, **54**
Elk, Roosevelt, **Cover No. 3**
Emu, friendly with Wallaby, **45**
Epibulus insidiator, **88, 90, 91**
Estes, Richard D., "A Visit to Our First Takin," 37
  feeds Takin, **37**
Etosha Pan, Elephants dig water holes in, **133**
  reserve, 130-136
  road to, **132**
  wildlife in, **134, 135**
Exuma Cays, becomes Bahamas National Trust, 95

F

Farm-in-the-Zoo, opening date, 63
  attendance in 1959, 189
Fern, tree, in Costa Rica, **12**
Flamingo, American, 62
  Andean, 62
  Chilean, 62
  four species in collection, 62
  Greater, 62
  James's, 62
  Lesser, 62
Fleay's Fauna Reserve, 43
Fleay, Rosemary, "Orphanage for Australian Animals," 43
Foster, Keeper Charles, **159**

G

Gandal, Charles P., at A.A.Z.P.A. meeting, 158
  at Veterinary meeting, 158
Garden Party, 1959, date of, 63
Gemsbok, herd of, **134**
  in Africa, **24**
Genetics Laboratory, reconstructed, 31
Geophagus jurupari, **19, 20**
Gerenuk, pair of, **144**
Giraffe, Angola, race of, **135**
  moving, **159**
Gordon, Myron, death of, 62

Gorgon's Head, **114-117**
Gorillas, take shower baths, **111-113**
Griswold, Oliver, "The First Tody to Be Exhibited Alive," 98
Gulls, kept from feeding, 30

H

Hale, Roger, **156**
Heads & Horns Museum, reopened, **188**
Herald, Earl, sends Long-jawed Wrasse, 88
Herpestes auropunctatus, 49
  ichneumon, **49**
Hippopotamus, born in Zoo, 31
  Peter II, **Cover No. 5**
Hog-nosed Snake, Common, **142**
Holothurin, 138
Honer, Fred, and Hornbill, **143**
Hornbill, Black-wattled, **143**
  White-crested, received, 187
Hybrids, Swan, 172

I

Ichneumon, **49**
Iguana, Green, 82, **83, 84, 86, 87**
Iguana iguana, 82, **83, 84, 86, 87**
Ivory, taken from poachers, **53**

J

Jacobi, Dr. E. F., sends Wisents, 153
Jakowska, Sophie, "Coney Island Sea-urchins," 137
Jacamar, Rufous-tailed, **74**

K

Kangaroo, Red, orphaned, **44**
Kenya Wild Life Society, 53
Kilimanjaro, Mount, **51**
Kingfisher, Blue-breasted, at Annual Meeting, **18**
Kinkajou, longevity of, 187
Komodo Monitor, gets exercise, 158
  male dies, 127
Kudu, Lesser, pair of, **145**

L

Land-and-Sea Park, Bahamas, 95
Lester, Henry M., photographs by, **47**
Lechwe, Red, in Africa, **25**
Lion, new cubs, **47**
  status in Kenya, 52
Lioness, resting, **135**
Lions, offered to Zoos, 93
  young, acquired, 31
Longevity, of Costa Rican Quetzal, 159
  of Kinkajou, 187
Lophius americanus, disease of, 63

M

Malacorhynchus membranaceus, **147-152**
Mambo, Lowland Gorilla, takes shower bath, **111-113**
Manakin, Golden-headed, capture of, **69-71**
Mandrill, **78**
Marco Engineering Co., at Aquarium, 36
Matamata, **167-169**
  swimming ability of, 167
Merck, George Wall, **186**
Milton, Ann M., **173**
  "The First Takin in America," 173
  Eric, **173**
  Oliver M.B., measures Takin, **41**
  visits Takin, 37
Mongoose, African, **49**
  Indian, 49
Monitor, Komodo, gets exercise, 158
  male dies, 127
Monkey, Bald Uakari, **80**
  Hamlyn's-l'Hoest hybrid, **80**
  Silvered Leaf, **81**
  Spider, **79**
  Uele Colobus, **Cover No. 2**
  Woolly Spider, received, 127
Monkey House, remodelled, **77-81**
Motion picture, documentary on Zoo, 159
Mouth-breeding in fishes, 20

N

Namutoni Fort, **136**
National Parks, in Africa, 50
Natura Artis Magistra, Wisents in, 153
Nest, of Great Tinamou, 182
  Robin, on fire escape, **94**
Nests, bird, **56-59**
Nigrelli, Ross F., at A.I.B.S. meeting, 158
  to Istanbul, 158
  to London, 94
Nyala, Mountain, **118**
  habitat, **121, 122**

O

Okapi, baby, **Cover No. 6, 162, 163, 165, 166**
  birth of, 162
    in Chicago Zoo, 162
  measuring, **165**
  stall prepared for birth, **164**
Oliver, James A., **17**
  named director of Museum, 126
  "The Matamata: Surely *All* Turtles Can Swim?" 167
Olor buccinator, **171**
Oral incubation in fishes, 20
Oropendola, nest of, 60
Osborn, Fairfield, editorial: "The Arts of Nature," 1
  "Aquarium — On the March," 33
  "The Best Thing New York City Has," 65
  "Progress?" 97
  "Reprieve of the Trumpeter," 129
  "Reserve Stock," 161
  receives LL.D. degree, 127
Ostrich, in Africa, **27**
  South African, falls through ice, **16**

P

Penguin, Adelie, film wins award, 94
  Annie, father of chicks, 30
    killed by vandals, 62
    offspring of, **63**
  King, incubating egg, 127
Pharomachrus mocinno costaricensis, longevity of, 159
Phoenicoparrus andinus, 62
  jamesi, 62
Phoenicopterus antiquorum, 62
  chilensis, 62
  minor, 62
  ruber, 62
"Physiology of Pituitary Gland of Fishes," sales of, 31
Picathartes, Gray-necked, 14
  White-necked, **Cover No. 1, 14**
Picathartes gymnocephalus, **Cover No. 1,** 14
  oreas, 15
Platypus, death of male, 31
Poaching, in Africa, 50
Porcupine, albino, 31
Potos flavus, longevity of, 187
Procnias averano carnobarba, **66, 67, 69, 74-76**
Python, Amethystine, received, 94
  Indian Rock, being measured, **17**

Q

Questions, asked at Zoo, 159
Quetzal, Costa Rican, longevity of, 159

R

Rat, Giant Pouched, **124**
Rattlesnake, Eastern Diamondback, **142**
Ray, Carleton, "The Basket Starfish," 114
  with "Calypso," 189
Rhinoceros, Black, in Kenya, 52
  White, in Natal, **22**
Reid, Melvin J., observes breeding of *Geophagus,* 20
Reptiles, sounds made by, 140
Robin, nests on fire escape, **94**
Rolla, Assistant Head Keeper, **165**
Ruggieri, George D., work with Sea-urchins, 138

S

Schweitzer, Mrs. Jerome N., gives shells to Aquarium, 31
Sealion, jumping to feed, **Cover No. 4**
Sea-urchin, Purple, **137, 139**
  decline in numbers, 138
Shells, given to Aquarium, 31
Simon, Noel, "Wildlife Challenges in East Africa," 50
Skutch, Alexander F., **13**
  "Red-throated Caracara — the Scourge of the Wasps," 8
  "The Great Tinamou of the Tropical Forest," 179
Solanto, Keeper, rears Penguin chicks, 63
Sounds, made by reptiles, 140
South West Africa, wildlife reserve in, 130
Sparrow, House, nests of, 57
Spider Monkey, Woolly, received, 127
Springbok, in Africa, **26**
Starfish, Basket, **114-117**
Stenlund, Milt, "Our White-tailed Deer Problem," 106
  "Timber Wolves of the Wilderness," 2
Sumaili, Mountain Gorilla, takes shower bath, **112, 113**
Superior National Forest, wolves in, 2
Swan, Trumpeter, exhibited in Zoo, **171**
  hybrids, 172
  North American population of, 171
  protection of, 129
Swimming, by Caspian Turtle, 170
  by Matamata, 167
Synoeca sp., **8**

T

Takin, **37, 39-41**
  habitat, **174, 175**
  in Burma and New York, **173, 176, 177**
  quarantine in New York, 157
Tee-Van, John, assumes Directorship of Zoo, 126
Temperature, effect on iguana, 86
Thrush, Red-winged, nest of, **58**
Tinamou, Great, habitat, **181**
  in Costa Rica, **179**
Tinamus major, **179**
Tit, Willow, nest of, **59**
Todus multicolor, **99, 104**
Tody, Cuban, **99, 104**
  habitat, **103**
  Puerto Rican, nest of, **100**
Touraco, Giant Blue, received, 187
  Ross's Violet, received, 187
Tragelaphus buxtoni, **118**
Treichel, George, "Africa — and Our Wildlife Heritage," 22
  Jeanie, "Etosha Pan — in the Largest Wildlife Reserve," 130
Troglodytes troglodytes, nests, 58
Trogon, Green-backed, 70
Trogon strigilatus strigilatus, 70
Turtle, Alligator Snapping, being weighed, **17**
  Large-headed River, **49**
  Reeves's, acquired, 31

U

Uakari, at Annual Meeting, **18**
U Kyaw Thein, Director of Rangoon Zoo, **177,** 178

V

Viper, Saw-scaled, **141**

W

Wallaby, Red-necked, orphaned, **45**
Walrus, Atlantic, Olaf, **144**
Warham, John, "The Pink-eared Duck," 146
Wasps, eaten by Caracara, **8**
Webb, Cecil, captured Picathartes, 15
Weyer, Mrs. Dora, supplies Giant Pouched Rat, 124
Wisent, **153, 154**
  pair received, **153**
Wildlife Sanctuaries, in Africa, 50
Wildlife Survey, Burma, 37
Wolf, Timber, **2**
  food of, 5
  habitat, **3**
  hunting habits, 6
  predation on deer, 7
  range in Minnesota, 5
  weight of, 5
  White-tailed Deer killed by, **6**
Wombat, as pet, **43**
Wrasse, Long-jawed, **88, 90, 91**
Wren, House, nest of, 58

Y

Yila, photograph by, **51**

Z

Zebra Duck, **147-152**
Zebras, stampeding, **130**
Zoological Park, attendance in 1958, 30
  documentary film on, 159
Zoological Society, at Waldorf-Astoria, **18**
  Garden Party, 63

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Is January 7

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